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Molecular tectonics: Tetracarboxythiacalix[4]arene derivatives as tectons for the formation of hydrogen-bonded networks

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Abstract

© The Royal Society of Chemistry 2016.A series of thiacalix[4]arene derivatives blocked in the 1,3-alternate conformation and bearing four carboxylic acids have been designed and synthesized. These compounds, owing to the H-bond donor (OH moiety) and acceptor (CO group) nature of the carboxylic acid moieties, behave as self-complementary tectons and lead to the formation of tubular 1D H-bonded networks in the crystalline phase. Upon deprotonation of the self-complementary neutral compounds, i.e. transformation of carboxylic acid moieties into carboxylates, anionic tectons are generated. Due to their propensity to form H-bonded networks in the presence of a dicationic H-bond donor tecton of the cyclic bis-amidinium type, designed to behave as a molecular staple interconnecting two carboxylates moieties, 1- and 2-D H-bonded networks are formed under self-assembly conditions.

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